

III. COHO SALMON MANAGEMENT ASSESSMENT

South of Cape Falcon

Management Goals and Preseason Expectations

Coho management objectives for California and Oregon fisheries south of Cape Falcon are to maximize catch of OPI area hatchery coho stocks while achieving the escapement goal for OCN stocks (200,000 adults in 1988). Consideration was also given to the impact rate of these fisheries on Washington coastal and Puget Sound coho stocks.

Portions of the south of Cape Falcon area coho fisheries have been restricted by management objectives for Klamath River fall chinook. Recent reductions in allowable harvest rates established for Klamath River fall chinook in the KMZ area have resulted in significant changes in the time and area distribution of harvest impacts on OCN stocks.

Beginning with the 1987 season, a revised salmon FMP allocation schedule was implemented for ocean troll and recreational users south of Cape Falcon. The revised allocation provides a transfer ("rollover") of a portion of the recreational quota to trollers about August 1 if the projected total ocean recreational fishery catch is less than the preseason harvest allocation.

Allowable harvests for 1988 were based on preseason abundance estimates for individual OPI area stock units including public hatchery, private hatchery, and OCN. Preseason abundance estimates were 1,590,600, public hatchery coho; 464,300, private hatchery coho; and 302,500 OCN coho. Fishery impacts and catch quotas for final Council-adopted seasons were assessed using a microcomputer spreadsheet version of the WDF/NBS catch-regulation model.

Council-adopted preseason regulations allowed a total fishery impact of 983,100 coho associated with ocean fisheries south of Cape Falcon. The STT, using procedures described in preseason report I (February 1988), estimated the OCN coho ocean escapement would be 210,300 fish under adopted regulations, sufficient to achieve the spawning escapement goal of 200,000 fish after inriver harvest.

Ocean Fisheries

Troll

The 1988 ocean troll fishery south of Cape Falcon was subject to an overall preseason harvest impact of 684,700 coho based on preseason estimates of troll catch and impacts (hooking mortality) by catch area. An estimated 59,400 coho were projected preseason to be lost to hooking mortality, leaving 625,300 for actual harvest. This compares to 401,700 available for harvest in 1987 (adjusted inseason to 436,700).

The Council made an inseason adjustment (i.e., rollover) on August 15 to the ocean troll fishery quota south of Cape Falcon to account for lower than anticipated coho recreational harvest. The south of Cape Falcon troll coho catch quota was increased by 45,000 coho from 625,300 to 670,300, while the recreational area quota was reduced from 298,400 to 253,400.

The overall inseason adjusted total troll catch quota of 670,300 was partitioned into several subquotas. For the Florence South Jetty to Orford Reef Red Buoy subarea, a 153,900 coho ceiling (adjusted inseason to 167,000) provided a catch level that approximated the Coos Bay area's catch of recent historical harvest levels relative to the other Oregon coastal catch areas of Tillamook and Newport. It also provided a ceiling on OCN coho impacts similar to historical impact levels, unlike 1987 when the unregulated Coos Bay area coho catch far exceeded historical averages due to a large fishing effort increase in response to the area's abundant chinook stocks.

A second subarea catch quota of 89,000 coho (100,000 maximum allowed harvest impact) was set for the commercial fishery in the area from Humbug Mountain (Oregon) to the U.S.-Mexico border.

All south of Cape Falcon troll fisheries landed a total of 676,000 coho, slightly above the inseason adjusted quota (Table III-1). The Florence to Orford Reef Red Buoy area landings totaled 162,400 coho, 3 percent below the inseason adjusted quota. Troll landings south of Humbug Mountain were 52,300 coho; 41 percent below the preseason subarea catch quota (Table I-9).

The all-species fishery opened July 1 and continued through July 13 for the Cape Falcon to Cape Arago area. Landing restriction differences by subarea were intended to provide for equitable distribution of the catch. The Cape Falcon to Cascade Head fishery was for all species while the Cascade Head to Cape Arago area was under a ratio fishery requirement of at least one chinook for each two coho landed during the July 1 through July 13 period.

The all-species fishery from Cape Arago to Orford Reef Red Buoy was closed July 1 through July 15 to reduce ocean catch impacts of Klamath River fall chinook outside of the KMZ. The entire Cape Falcon to Orford Reef Red Buoy area was opened for all species from July 16 through August 19 when the overall south of Cape Falcon coho catch quota (as revised inseason) was taken.

Coho fishing in the KMZ was limited to the general June 5 through June 7 season and the late season Trinidad Head to Punta Gorda, California, (Eel River area) all-species fishery within 6 nautical miles, September 1 through September 8. Total coho harvest in the Eel River fishery was 1,500 fish.

For California south of the KMZ area, the troll all-species fishery was opened from Horse Mountain to Point Arena, June 5 through July 13 (Sunday through Wednesday only) and July 17 through August 19. From Point Arena to the U.S.-Mexico border, the all-species fishery was open June 1 through August 19 with no species landing restrictions. California coho harvest south of the KMZ totaled 28,800 fish while the KMZ catch totaled 23,500 coho, including 1,500 fish harvested in the September Eel River mouth ocean fishery.

A preliminary postseason estimate by ODFW of coho hook-and-release mortality in chinook-only troll fisheries is estimated by ODFW to be 112,700 coho compared to the preseason estimate of 59,400. Factors contributing to this year's higher loss and similar high losses since about 1986 are: (1) major increases in troll effort (vessel days) in the Cape Falcon to Orford Reef Red Buoy area particularly during the spring (May through June) chinook-only fisheries to take advantage of high chinook abundance and harvest opportunity; (2) larger coho stock sizes; and (3) longer periods of chinook-only fishing

Table III-1. Ocean harvest and hooking mortality impacts for coho salmon by all fisheries in the OPI area during the 1988 season with comparable catches for 1987, 1986, and 1985 in thousands of fish.

Management Area	1988 Ocean Catch Quota	Percent of 1988 Quota	Ocean Catch (thousands of fish)			
			1988 ^{a/}	1987 ^{a/}	1986	1985
<hr/>						
<u>TROLL</u>						
Leadbetter Pt. to Cape Falcon	2.8 ^{b/}	-	2.8 ^{b/}	26.2	94.2	32.8
South of Cape Falcon	670.3 ^{c/}	1.01	676.0 ^{d/}	385.7 ^{e/}	428.3 ^{f/}	55.4 ^{g/}
Oregon	-	NA	623.0	342.1	393.8	44.3
California	-	NA	50.9 ^{h/}	43.6 ^{i/}	34.5	11.1
Troll Total	NA	NA	678.8 ^{d/}	411.9	522.5	88.2
<u>RECREATIONAL</u>						
Leadbetter Pt. to Cape Falcon	30.0	96	28.9	87.7	104.4	110.8 ^{j/}
Cape Falcon to U.S.-Mexico Border	253.4 ^{k/}	98	249.0	198.1	191.4	166.7
Oregon	-	NA	216.4	152.1	174.6	151.5
California	-	NA	34.7 ^{l/}	46.0 ^{m/}	16.8	15.2
Recreational Total	283.4	98	277.9	285.8	295.8	277.5
Total OPI Ocean Fisheries	NA	NA	956.7 ^{d/}	697.7	818.3 ^{f/}	365.7 ^{g/j/}

a/ Preliminary.

b/ Coho hooking mortality in chinook-only troll fishery.

c/ Includes 45,000 "rollover" from troll fishery to recreational fishery, August 12, 1988.

d/ Does not include the postseason hooking mortality estimated at 112,700 coho in south of Cape Falcon commercial troll fishery.

e/ Does not include the postseason hooking mortality estimated at 17,700 coho in south of Cape Falcon commercial troll fisheries.

f/ Does not include the postseason hooking mortality estimated at 57,400 coho in south of Cape Falcon commercial troll fisheries.

g/ Does not include the postseason hooking mortality estimated at 44,000 coho in south of Cape Falcon commercial troll fisheries.

h/ Includes 1,500 coho caught in September 1 through September 8 Trinidad Head to Punta Gorda all-species troll fishery.

i/ Includes 1,515 coho caught in the September 8 through September 30 Trinidad Head to Punta Gorda all-species troll fishery.

j/ Includes fishery catch of 10,500 coho from Buoy 10 fishery in the mouth of Columbia River, August 18 through August 22, until Columbia River area ocean fishery closed plus 300 fish caught illegally in the ocean north of Klipsan Beach.

k/ Inseason revised quota after 45,000 coho "rollover" from troll fishery August 12, 1988.

l/ Includes 274 coho caught in September 12 through September 30 Trinidad Head to Punta Gorda all-species recreational fishery.

m/ Includes 183 coho caught in the September 14 through September 30 Trinidad Head to Punta Gorda all-species recreational fishery.

due to coho quota restrictions. With the addition of coho hooking mortality, the south of Cape Falcon troll fishery impact is estimated to be 788,700 coho, 8 percent above the inseason adjusted troll harvest impact of 729,700 coho.

Recreational

The ocean recreational fishery had a quota of 298,400 coho (adjusted inseason to 253,400) with different opening dates for the Cape Falcon to Orford Reef Red Buoy, Orford Reef Red Buoy to Horse Mountain (KMZ area), and south of Horse Mountain subarea (Table I-3). Daily and/or weekly bag limits and minimum size limits also varied by subarea. The overall south of Cape Falcon inseason revised quota was not reached by the season closing date.

For the Cape Falcon to Orford Reef Red Buoy subarea, the recreational all-species season opened May 1 through May 27 in waters less than 27 fathoms deep (approximately zero to two miles). This restriction was intended to reduce early-season coho harvest and expand chinook fishing opportunities. From May 28 through September 11, the fishery was open without the depth restriction. Ocean recreational fishermen landed 201,300 coho in this area (134,700 in 1987), 81 percent of the entire south of Cape Falcon recreational catch.

The KMZ area recreational fishery opened May 28 and closed on September 11 with the general south of Cape Falcon closure. However, beginning July 10 in the state waters and July 12 in federal waters, the KMZ daily bag limit was reduced to one salmon (either species) through the remainder of the season. This regulation change reflected management intent to reduce high chinook catch rates observed in June and early July, thereby avoiding inseason closure. Catch rates for both chinook and coho were effectively reduced by the bag limit reduction. The 1988 KMZ general season provided a coho harvest of 52,900 fish.

In the area south of Horse Mountain, the all-species season was continuous from February 13 through November 13 with a two fish daily bag limit. A total of 3,500 coho were harvested compared to 2,600 coho in 1987.

Inside Fisheries

River and estuary recreational coho fisheries in this area are considered to have minor impact on critical coho stocks. Recreational fisheries operating in Yaquina and Coos bays target primarily private hatchery fish, while fisheries in other coastal estuaries and rivers target a mix of natural and hatchery stocks. The 1988 harvest information for inside fisheries is not available.

Spawning Escapement

Public Hatchery Escapements

The preliminary estimate (through January 15, 1989) of total coho returns to Oregon coastal (south of Cape Falcon) and Klamath River hatcheries is 45,700 adults (36,100 in 1987). Approximately 32,800 adult coho returned to Oregon coastal facilities, 150 percent above the 1987 returns. An estimated 12,900 adults returned to Klamath River hatcheries, 44 percent below 1987 returns. Both Oregon coastal and Klamath River hatchery goals were reached. (Table III-2).

Table III-2. Preliminary 1988 adult (male and female) salmon escapements in thousands of fish to ODFW coastal salmon hatcheries and CDFG hatcheries on the Klamath River compared with escapements since 1973 and 1988 management goals.

Year	Oregon Coastal (ODFW)			Klamath River California		
	Chinook		Coho	Chinook		Coho
	Spring	Fall		Spring	Fall	
1973	-	4.2	18.4	2.5	8.6	8.0
1974	-	1.6	35.1	4.3	12.5	0.5
1975	-	2.1	4.9	3.7	10.3	0.3
1976	2.9	0.5	38.7	3.3	14.0	4.3
1977	2.4	4.2	6.5	1.1	6.3	0.9
1978	4.4	1.6	5.6	3.8	13.0	1.8
1979	7.0	2.0	23.0	1.4	3.6	3.0
1980	7.9	1.8	22.4	0.5	6.5	3.6
1981	2.5	1.8	21.5	2.4	4.4	2.9
1982	4.1	2.3	15.8	1.3	10.4	4.9
1983	3.9	4.0	12.8	0.8	14.1	4.0
1984	5.6	3.3	34.7	1.1	7.2	2.0
1985	8.7	3.5	17.1	2.9	21.2	9.9
1986	30.6	5.8	37.7	8.1	32.4	3.5
1987	22.8	7.1	13.1	8.8	28.4	23.0
1988 ^{a/}	22.3	6.5	31.3	15.1	32.5	12.9
1988 Goal ^{b/}	7.8	3.7	12.4	3.0	17.5	2.3

a/ Preliminary returns through January 12, 1989.

b/ Hatchery escapement goals for ODFW include number of adult fish needed to meet 1988 agency production goals (e.g., STEP and department hatchery production goals for smolts and presmolts) and do not include private hatchery needs.

Private Hatchery Escapements

Total 1988 adult coho returns to Oregon private aquaculture facilities are estimated to be 116,100, similar to the 119,000 fish in 1987 (Table II-6).

OCN Escapement

Spawning surveys are completed for coastal river systems, but final analysis is not yet available. A preliminary assessment of OCN spawning escapement, adjusted for private and public hatchery strays in some systems, indicates about 152,200 adult spawners (Table III-3).

Goal Assessment

Postseason evaluations indicate that enough coho escaped to inland areas to meet Klamath River basin and Oregon coastal public hatchery smolt production goals.

Preliminary escapement information suggests the OCN spawning escapement goal of 200,000 was not achieved. The preliminary estimate of escapement as of February 10, 1989 is 152,200.

Quotas and catches for 1988 are compared to 1985-1987 catches in Table III-1. A review of OPI catch and escapement since 1970 is shown in Table III-4.

Coho Salmon Management North of Cape Falcon

Management Goals and Preseason Expectations

Management goals for fisheries which impact coho in the area north of Cape Falcon are described in the Council's framework amendment (Section 3.1.1.2, page 3-3). Coho stocks impacted by these fisheries include natural and hatchery stocks which originate from Oregon coastal rivers and lakes, the Columbia River, Washington coastal rivers, Puget Sound, and southern British Columbia. Stock-specific impacts of fisheries vary by time and area. Generally, Washington coastal and Puget Sound origin stocks are found in greater concentration in more northerly areas, while fisheries operating in more southerly areas show increasing contributions to catches by Columbia River and Oregon coastal stocks.

The allowable coho harvest for fisheries operating in this area in 1988 was based on the need to protect several depressed Washington coastal and Puget Sound natural coho stocks.

Puget Sound natural coho stocks from the Skagit River and Hood Canal were not expected to be sufficiently abundant to achieve their respective spawning escapement goals. Minimum escapement goals for Washington coastal area natural stocks from Grays Harbor and the Hoh and Queets rivers, were not expected to be achieved. Expectations assumed an anticipated level of harvest by the Canadian troll fishery off the west coast of Vancouver Island (1.8 million) and, in some cases, by inside area fisheries directed at other species and stocks.

Table III-3. Estimated escapements in thousands of Oregon coastal public hatchery and natural adult coho stocks, 1971-1988 with 1971-1975 average.

Year	Total Returns to Facility	N.F. Umpqua Winchester Dam	Returns from Off-Station Releases	Natural Spawning Escapement (OCN) ^{a/}			Total Coastal Freshwater Catch ^{b/}	Total Estimated Ocean Escapement to Coast ^{c/}
				Lakes	Rivers	Total OCN		
1971-1975	20.1	-	14.9	166.6	181.4	16.6	-	
1971	29.1	0.4	-	30.8	293.2	324.0	24.1	-
1972	12.9	0.3	5.7	10.8	116.9	127.7	16.6	162.9
1973	18.4	0.4	4.5	18.8	143.5	162.3	15.4	200.6
1974	35.1	0.4	7.5	7.9	126.4	134.3	13.5	190.4
1975	4.9	0.5	0.9	6.1	153.0	159.1	13.5	178.4
1976	38.7	0.3	16.8	6.5	156.8	163.3	19.6	238.4
1977	6.5	0.4	2.5	6.8	61.0	67.8	13.5	90.3
1978	5.6	0.5	2.0	5.1	72.2	77.3	4.5	89.4
1979	23.0	0.4	15.8	6.8	167.0	173.8	1.5	214.1
1980	22.4	0.2	13.8	6.5	104.3	110.8	6.3	153.3
1981	21.5	0.1	9.5	7.2	70.5	77.7	9.9	118.6
1982	15.8	2.7	13.3	7.2	124.7	131.9	14.7	175.7
1983	12.8	1.2	7.0	4.3	55.5	59.8	6.8	86.4
1984	34.7	3.2	5.5	13.5	194.0	207.5	17.4	265.1
1985	17.1	4.0	7.9	9.2	183.4	192.6	15.6	233.2
1986	37.7	9.6	6.0	12.0	178.8	190.8	7.7	251.8
1987	12.9	2.2	3.2	5.7	74.3	80.0	NA	NA
1988 ^{d/}	32.3	NA	NA	6.7	152.2 ^{e/}	158.9	NA	NA

a/ May include some private hatchery strays after 1978.

b/ Freshwater sport catch from ODFW salmon/steelhead punch card information and represents only those fish >24 inches (i.e., adults).

c/ Does not include private hatchery returns.

d/ Preliminary data.

e/ Preliminary area-under-the-curve estimates of spawning adults expanded from index stream system surveys through approximately January 15, 1989. Counts adjusted for private hatchery strays based on 1987 stray rates and adjusted for public hatchery/STEP facility strays in the Umpqua River basin.

Table III-4. OPI adult coho catch and escapement in thousands of fish, 1970-1988.^{a/}

Year	Ocean Fisheries		Inland Escapement		Total OPI	Private Hatchery	Adjusted OPI ^{c/}
	Troll	Sport	Coastal ^{b/}	Columbia River		Fish in OPI Ocean Catches	
1970	1,394.0	475.2	40.5	872.2	2,781.9		
1971	2,422.1	681.7	29.7	527.0	3,660.5		
1972	1,214.9	533.6	13.3	269.0	2,030.8		
1973	1,257.4	422.1	26.8	283.8	1,990.1		
1974	1,995.3	636.8	36.0	452.9	3,121.0		
1975	1,027.8	441.6	5.7	292.2	1,767.3		
1976	2,796.3	931.1	43.0	326.3	4,096.7		
1977	632.8	392.5	7.8	87.3	1,120.4	8.2	1,112.2
1978	1,051.6	499.6	8.2	297.3	1,856.7	21.5	1,835.2
1979	1,006.3	318.5	25.9	264.3	1,615.0	40.3	1,574.7
1980	482.8	501.3	25.6	287.9	1,297.6	44.2	1,253.4
1981	789.2	327.6	24.1	162.4	1,303.3	144.6	1,158.7
1982	691.4	272.1	22.5	435.9	1,421.9	122.2	1,299.7
1983	401.1 ^{d/}	260.7	11.2	104.2	777.2	135.2	642.0
1984	84.8 ^{e/}	175.5	33.8	407.4	701.5	10.2	691.3
1985	132.2 ^{f/}	264.3	29.7	356.2	782.5	63.3	719.1
1986	577.5 ^{f/}	295.8	49.0	1,517.6	2,440.0	94.9	2,345.1
1987	429.6 ^{g/}	285.8	37.2	300.9	1,053.6	170.0	883.6
1988 ^{h/}	788.7 ^{i/}	277.9	45.4	601.7	1,713.7	104.6	1,609.1

- a/ Components of the OPI are California, Oregon, and Ilwaco troll harvest; California, Oregon, and Ilwaco sport harvest; Columbia River gillnet catch, hatchery, and dam escapements; Oregon coast hatchery escapements and Winchester Dam counts (Umpqua); and Klamath River hatchery escapements. Does not include OCN coho freshwater catch, OCN spawning escapement, STEP hatchery returns, or Oregon coastal private hatchery returns. This table differs from previous years due to finalization of historical private hatchery contribution to OPI area fisheries and minor adjustments to ocean catches and inland escapements.
- b/ Oregon coastal and California combined. Includes estimates of adult returns from off-station hatchery releases, the number of fish entering hatchery facilities, and Winchester Dam counts.
- c/ For 1970-1976, total OPI excludes catch of private hatchery fish and is identical to the adjusted.
- d/ Includes estimated hooking mortality of 24,000 coho during all-species-except coho troll fishery south of Cape Falcon, including California.
- e/ Includes estimated hooking mortality of 44,000 coho during all-species-except coho troll fishery from Cape Falcon to Cape Blanco.
- f/ Includes estimated hooking mortality of 57,400 coho during all commercial fisheries south of Cape Falcon.
- g/ Includes estimated hooking mortality of 17,700 coho during all commercial fisheries south of Cape Falcon.
- h/ Data are preliminary.
- i/ Includes estimated hooking mortality of 112,700 coho during all commercial fisheries south of Cape Falcon, except for California.

OCN coho contribute a minor portion of their total ocean harvest to fisheries north of Cape Falcon. This stock's management objectives were not considered in the determination of allowable harvest for fisheries in this area.

Columbia River hatchery stock abundance is an important consideration in determining allowable ocean harvest. The 1988 expected stock abundance for Columbia River hatchery stocks was approximately three times the level of abundance used for planning 1987 fisheries. High relative abundance of Columbia River stocks results in decreased rates of impact on weak natural stocks of coho in mixed stock ocean fisheries for a particular level of ocean harvest.

The total nontreaty allowable coho impact for the ocean fisheries was allocated to commercial and recreational fisheries under an emergency deviation from the Council's framework amendment which included an agreement for a chinook-for-coho trade which exceeded 25 percent of the allocation.

Ocean Fisheries

Nontreaty Troll

Nontreaty troll fishing opportunity during 1988 did not allow for any coho harvest. The chinook species directed fishery, which operated from May 1 to June 14, allowed for an incidental hooking mortality of approximately 2,800 coho. Direct postseason estimates of this mortality are not available.

Treaty Indian Troll

The treaty Indian troll fishery was constrained by a total coho quota of 68,000 for the Klallam, Hoh, Makah, Quileute, and Quinault tribes operating in ocean fishing areas and in Area 4B (for the May 1 through September 30 ocean management period). Plans for an all-species troll fishery, originally scheduled to commence in late June, were altered by the tribes due to concerns for the potential for loss of chinook harvest opportunity from early harvest of the coho quota. The all-species fishery was opened on July 10, under ratio fishery regulations of a minimum of one chinook for every two coho. Ratio restrictions were removed on July 20 and the fishery was closed August 21 according to a plan developed by the treaty troll tribes. The fishery reopened September 1 and continued until September 3. Total season coho impact for the treaty troll fishery in the ocean area (and Area 4B) was 70,100 (67,600 catch plus 2,500 coho hooking mortality during the July ratio fishery). An additional 600 coho were caught in eastern Strait of Juan de Fuca, Areas 5 and 6C.

Recreational

Subarea coho harvest quotas were established from the total recreational fishery quota of 100,000, with the intent of equitably distributing benefits of the total allowable harvest among the three major subareas.

The Columbia River subarea opened July 11 and coho catches were projected inseason to have reached the quota (30,000) after 10 fishing days (July 24). The postseason total catch estimate is 28,900 fish. The Westport subarea's season opened July 3 with a quota of 50,000 and was closed after 21 fishing days, with the catch totaling 48,300. The Neah Bay-La Push subarea, which

also opened July 3, had a coho quota of 20,000. This subarea was closed after 23 fishing days and a catch of 18,100 coho. Both northern subareas were reopened for 24-hour fisheries to harvest the shortfall of catch to the overall recreational fishery allowable harvest; August 18 for the Westport subarea and August 19 for the Neah Bay-La Push subarea. The northern subarea was subsequently reopened September 2 for 24 hours to harvest the remaining difference between total catch and the overall recreational quota. Final coho catches for the subareas were: Columbia River, 28,900; Westport, 50,200; Neah Bay-La Push, 19,300. The grand total recreational coho catch was 98,400.

Columbia River Coho

Inside Fisheries

Coho harvest statistics for Columbia River commercial and recreational fisheries are presented in Appendix B, Table B-20. The 1988 Columbia River nontreaty gillnet fishery harvest was 308,000 coho. This compares to the 1987 catch of 165,100 and the 1971-1975 average catch of 199,400 coho. The treaty Indian mainstem commercial gillnet coho catch was 7,000. This compares to the 1987 catch of 2,300 and the 1971-1975 average catch of 9,100 coho. The mainstem recreational adult coho catch below Bonneville Dam was 144,100 with all but 300 taken in the Buoy 10 area (downstream of the Astoria-Megler Bridge). The Buoy 10 fishery opened on August 6 with a two fish bag limit through September 5 and a barbless hook restriction. The bag limit varied between one and two fish during the period from August 12 through August 24. The management intent for bag limit changes was to minimize fishery disruption and to maintain catches within the preseason guideline of a 100,000 coho catch in August. The postseason August estimates are 100,200 coho and 24,000 chinook from 121,400 angler trips. After September 5, the bag limit was increased to three fish. The fishery effort dwindled after mid-September and was minimal during October (Table III-5). Historical Buoy 10 catch and effort data are provided in Appendix B, Table B-21.

Ocean Escapement

The Columbia River ocean escapement of early and late coho stocks was 602,500 fish, up from the 1987 return of 300,300 adults (Appendix B, Table B-20), but substantially below preseason expectations. This return was 66 percent above the 1971-1975 average ocean escapement of 362,300 adults.

Goal Assessment

Ocean escapement for both early and late stock components of Columbia River coho met all hatchery production goals and provided for significant inside sport and commercial fishery opportunities.

Washington Coastal Coho

Inside Fisheries and Spawning Escapements

A stock by stock description of inside fisheries and spawning escapements is provided below. Estimates of escapement, and in some cases catch, are preliminary and are likely to be changed when final estimates become available. Annual estimates of inriver run size, harvest, and escapement for each coastal river are provided in Appendix B, Tables B-23, B-25, and B-26.

Table III-5. Estimated weekly effort in angler trips and catches of chinook and coho in the 1988 Buoy 10 sport fishery.^{a/}

Week Number	Ending Date or Period	Angler Trips	Catch		Catch Per Trip
			Chinook	Coho	
32	Aug. 7	10,673	1,930	5,672	0.71
33	Aug. 14	34,406	6,514	38,400	1.31
34	Aug. 21	32,205	5,911	20,076	0.81
35	Aug. 28	34,576	7,803	27,914	1.03
36	Sept. 4	29,499	6,103	18,957	0.85
37	Sept. 11	26,417	1,874	21,958	0.90
38	Sept. 18	9,177	468	6,240	0.73
39	Sept. 25	2,969	74	1,471	0.52
40	Oct. 2	1,545	4	1,125	0.73
41-44 ^{b/}	Oct. 30	4,000	0	2,000	0.50
Total		185,467	30,681	143,813	0.94

a/ Includes boat based fishery and shore-based fisheries at Clatsop Spit and Columbia River North Jetty.

b/ Sampling was ended on October 2. Weeks 41-44 were estimated by assuming similar effort as occurred during this period in 1986 and 0.50 coho/angler trip.

Willapa Bay - The total Willapa Bay gillnet catch was 49,100 coho, 23 percent less than 1987 but 26 percent greater than the 1981-1985 period average of 39,000 coho. The sport fishery harvest for 1988 is presently unavailable; the average sport catch for the period 1981-1985 is 2,200. Willapa Bay coho are managed for hatchery production. Escapement of hatchery coho to Willapa Bay facilities in 1988 was 30,300, slightly greater than the 1981-1985 average of 26,200 and well above program requirements.

Grays Harbor - Grays Harbor fisheries were very restricted in 1988 in anticipation of low returns of natural spawning Chehalis River coho. The total gillnet catch was 23,900 including 3,200 by non-Indian fishermen; 20,300 by the Quinault Indian Nation; and 400 by the Chehalis Tribe. The total catch compares with 52,600 coho caught during the 1987 season. Sport catch estimates for the 1988 season are not available at this time, but are expected to be below the recent 10 year average catch of 4,000.

Escapement of hatchery coho to Grays Harbor facilities totaled 51,000; well above the goal of 14,000 adults. Estimates of natural spawning escapement are not currently available.

Quinault River - The treaty Indian gillnet fishery targeted on hatchery coho from early September through late November. The total gillnet harvest of 12,800 was about 10 percent below the 1987 level.

Hatchery and natural escapements of Quinault River coho are not available.

Queets River - Queets River fisheries were established by preseason agreement and based on preseason abundance estimates and planned Council ocean fisheries. The treaty gillnet fishery operated six days per week through late September, targeting on early timed hatchery coho. Coho were also taken incidentally during large mesh gillnet fisheries targeting on chinook during freshets in October. The season-long harvest of fall coho by the net fishery was 5,400, less than half of the 1987 season catch. Present information suggests that natural run size was well below the preseason forecast. The river sport fishery operated through mid-October, targeting on hatchery fish.

The preseason agreement for management of the Queets River coho anticipated a spawning escapement of 4,200 natural coho, about 30 percent below the lower end of the spawning escapement goal range. Spawning index counts indicate that natural escapement may be even lower than 4,200.

Hoh River - The return of fall coho to the Hoh River was predominantly natural fish. Fishing schedules were according to preseason agreements and based on preseason abundance estimates and planned Council ocean fisheries. The treaty net fishery operated during September through November, targeting on chinook using large mesh gillnet gear and other restrictions intended to minimize wild coho catches. The season total treaty net catch was 300 coho of which less than 50 were of hatchery origin.

Spawner index counts indicate that natural escapement will be near the preseason expected level of 2,200, slightly greater than the lower end of the established escapement goal range.

Quillayute River - The summer coho run in the Quillayute River was managed primarily for its hatchery component. The treaty gillnet fishery targeted on

this run from mid-August through mid-September, harvesting 1,500 fish, 70 percent less than the 1983-1987 average catch.

The Quillayute fall coho harvest was based on a preseason management agreement. This run was managed for natural stock production objectives. The inseason update of the run indicated run sizes for natural and hatchery stocks were significantly less than was predicted preseason. The treaty net fishery operated from mid-September through mid-October. All fisheries, including the river sport, were closed at that time due to concern for natural coho. Three days of treaty net fishing, directed at fall chinook using large mesh gillnet gear, were allowed in mid-November. Treaty harvest of fall coho was 2,100; 60 percent less than the 1983-1987 average. The river sport catch estimate is currently unavailable.

Goal Assessment

The Council's ocean fishery management goals for Washington coastal stocks were to achieve sufficient ocean escapement to provide for inside fishery harvest opportunity and meet spawning escapement targets. Expected abundance of Queets and Hoh river stocks was known to be insufficient to achieve escapement goal ranges and provide for planned Council and river fisheries. Postseason estimates of escapement are unavailable for most stocks, but indications are that escapement targets for Queets and Quillayute river stocks will not be achieved, but that the targets for the Hoh River stock will be reached.

Puget Sound Coho

Inside Fisheries

Puget Sound coho stocks are utilized in both commercial and recreational inside fisheries.

Commercial Fishery - Commercial inside fishery harvest of Puget Sound coho is managed on the basis of six regional management stock units: Strait of Juan de Fuca, Nooksack-Samish, Skagit, Stillaguamish-Snohomish, South Sound, and Hood Canal. In addition, consideration is given to treaty/nontreaty allocations of Canadian stocks. Harvest of coho for each management unit is regulated according to the natural spawning escapement or hatchery program escapement goal for that unit. Commercial net harvest (treaty Indian and nontreaty) of coho in Puget Sound is presented in Appendix B, Table B-30. The 1988 total commercial catch was 31 percent less than the record high 1987 catch, but 30 percent greater than the average catch for the period 1981-1985. Nontreaty net harvest was 457,500 coho compared to 676,200 caught in 1987 and an average catch of 344,100 coho for the period 1981-1985. Treaty Indian net fisheries harvested 780,700 coho in 1988 compared to 1,122,100 in 1987 and an average catch of 606,600 for the period 1981-1985. A total of 6,000 coho were caught in Strait of Juan de Fuca waters east of the Sekiu River by the treaty Indian troll fishery. No nontreaty trolling was conducted in Puget Sound waters in 1988.

Recreational Fishery - Recreational coho harvest data for Puget Sound during 1988 are unavailable at this time. The total recreational harvest of coho in marine waters of Puget Sound in 1987 was 279,500 and the average catch during

the period 1981-1985 was 197,800. Historical recreational harvests are presented in Appendix B, Table B-31.

Spawning Escapement

Estimates of 1988 natural spawning escapements are unavailable at this time. Hatchery and natural run component escapements and catches for combined Puget Sound origin stock units, for the years 1976-1987 are presented in Appendix B, Table B-32. The Skagit and Hood Canal stock units are managed for natural run escapement goals of 30,000 and 19,100 adult spawners, respectively. Anticipated low abundance of the Skagit and Hood Canal natural stocks in 1988, and harvests by fisheries impacting this stock throughout its range, were expected to result in spawning escapement below goal levels for both of these natural spawning stocks.

Goal Assessment

Generally, hatchery egg take goals were achieved during 1988. Escapement estimates for natural stocks spawning on a wild basis are currently not available.

Coastwide Summary for Coho

A summary of 1988 performance for coho salmon by river system and stock in relation to escapement goals is presented in Table III-6.

Table III-6. Summary of 1988 performance for coho salmon by river system and stock in relation to escapement goals (1988 data preliminary).

System	1988 Escapement Goal	Escapement Goal Assessment
Columbia River and Oregon Coastal Coho (OPI)	OCN spawning escapement of 200,000.	Preliminary OCN escapement is 152,200; 76 percent of goal (adjustment for hatchery strays not complete).
Washington Coastal Coho	Natural spawning escapements within 1983 court-ordered range for Quillayute, Queets, and Hoh. Grays Harbor natural escapement of 35,400; meet hatchery egg take goals; meet treaty obligations.	Queets and Quillayute rivers natural escapement below lower end of management range. Hoh River escapement within goal range. Grays Harbor natural escapement goal estimate unavailable. Hatchery egg take goals achieved. No information available on catch allocation.
Puget Sound Coho	Meet escapement objectives for natural and hatchery stocks. Skagit River natural escapement expected to be below the goal (30,000). Meet treaty allocation requirements, and inside non-Indian fishery needs for 6 management units.	Data not available for natural spawning escapement. Hatchery egg take goals achieved for all stocks. No information available on catch allocation.